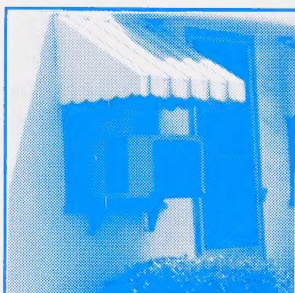
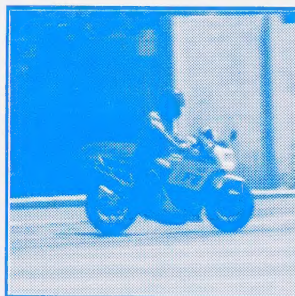
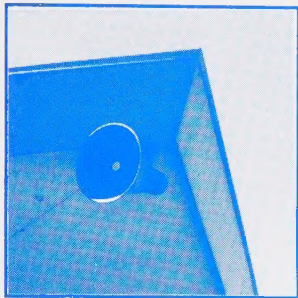


Department of Community Development

CITY OF SUNNYVALE




INSTITUTE OF GOVERNMENTAL
STUDIES LIBRARY
DEC 15 1997
UNIVERSITY OF CALIFORNIA

NOISE

SUB-ELEMENT OF THE GENERAL PLAN

March 25, 1997

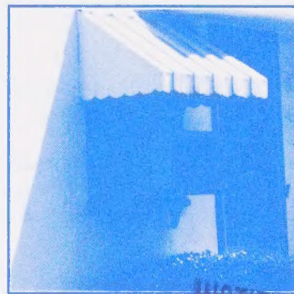
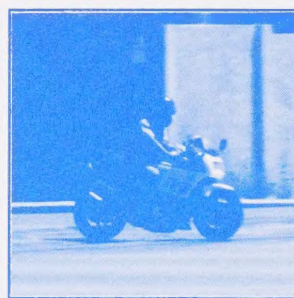
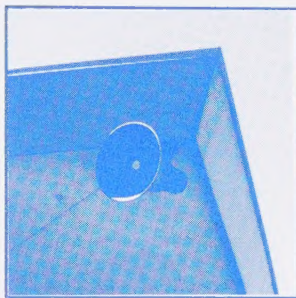


Digitized by the Internet Archive
in 2025 with funding from
State of California and California State Library

<https://archive.org/details/C124914917>

Department of Community Development

CITY OF SUNNYVALE



The Sub-Element complies with California Government
Code Section 65302 (f) and was adopted by the
Sunnyvale City Council by Resolution Number 119 - 97
on March 25, 1997

INSTITUTE OF GOVERNMENTAL
STUDIES LIBRARY

DEC 15 1997

UNIVERSITY OF CALIFORNIA

NOISE

SUB-ELEMENT OF THE GENERAL PLAN



ACKNOWLEDGEMENTS

City Council

Stan Kawczynski, Mayor
Jim Roberts, Vice Mayor
Landon Curt Noll
Robin Parker
Manuel Valerio
Pat Vorreiter
Jack Walker

Planning Commission

Nancy Walker, Chair
Vicky Piazza, Vice Chair
J. Creighton Bricker
Gerald Glaser
John N. Howe
Mark O'Conner
Michael Szymanski

Community Development Staff Contributing to the Sub-Element

David S. Boesch Jr., Director
Trudi Ryan, Planning Officer
Gail A. Price, Principal Planner
Cheryl Bissey, Principal Office Assistant
Bonnie Riley, Staff Office Assistant
Bingrong Shan, Associate Planner/GIS
Katrina M. Rice, Planning Intern

City Staff Contributing to the Sub-Element

Thomas F. Lewcock, City Manager
Valerie J. Armento, City Attorney
Karen Davis, Assistant to the City Manager
Robert Walker, Superintendent of Parks
Ray Williamson, City Traffic Engineer
Jack Witthaus, Transportation Planner
Members of the Planning and Economic Development Review Committee

Consultant

Illingworth & Rodkin, Inc., Acoustical Engineers
Fairfax, California

Sub-Element Prepared by

Teresa Zarrin, Assistant Planner





PREFACE

Noise is defined as unwanted sound. Freedom from excessive noise is one measure of the quality of life. As part of the Environmental Management Element of Sunnyvale's General Plan, the Noise Sub-Element identifies sources of noise in Sunnyvale and strategies for reducing the negative impact of noise.

The State of California requires cities and counties to consider noise in their plans, policies and actions. In 1971, the California Legislature amended the California Planning Law to require a Noise Element as part of the General Plan. The State also issued Noise Element guidelines in 1976. Of all General Plan regulations, those pertaining to Noise Elements are among the most specific in terms of content and method of preparation.

Sunnyvale's first Noise Element was adopted in 1972. The Noise Sub-Element was last updated in 1986. Since then, noise conditions have changed. This update assesses current and future conditions, and identifies strategies for living with noise.

*Noise is defined as
unwanted sound.*

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Introduction	1
Purpose	2
Major Findings	3
Summary of Goals and Policies	6

COMMUNITY CONDITIONS

Introduction	9
Types of Noises	9
Measuring Noise	10
Measuring Noise Over a Stated Period of Time	12
Regulating Noise	14
Overview of Sunnyvale Noise Conditions	24
Noise Condition Map	25
Technical Report for Noise Condition Map	26
Methodology Used to Develop Noise Condition Map	26
Noise Measurement Locations	27
Moffett Federal Airfield - Potential Noise Conditions for Year 2010	28
Transportation Noise	29
Traffic Noise Conditions	29
Future Traffic Noise Conditions	30
Moffett Federal Airfield - Existing Conditions	31
The Future of Moffett Federal Airfield	34
San Jose International Airport	35
Helicopters	37
Overflights	38
Current Train Noise	38
Future Train Noise	39
Light Rail Noise	40
Noise Environments for Outdoor Recreational Areas of Residential Uses	41

Community Noise42

Noise Complaints	43
Enforcement	44
Noise Complaints - Moffett Federal Airfield	45

Noise Reduction Techniques46

Soundwalls	46
Setbacks.....	47
Site Planning	47
Landscaping	48

The Strategic Plan49

Community Condition Indicators50

Updating the Noise Sub-Element51

Annual Update.....	51
Five Year Update.....	51

GOALS, POLICIES AND ACTION STATEMENTS

Introduction53

Goals, Policies and Action Statements55

Land Use Compatibility.....	55
Transportation Noise	58
Community Noise	62

APPENDICIES

Appendix A

Noise Condition Map	A-1
---------------------------	-----

Appendix B

Mitigated Year 2010 Forecast Noise Exposure Conditions, Moffett Federal Airfield	B-2
-------------------------------------------------------------------------------------------	-----

LIST OF TABLES

Table 1

Decibel Levels of Common Sounds.....	11
--------------------------------------	----

Table 2

State of California Noise Guidelines for Land Use Planning, Summary of Land Use Compatibility for Community Noise.....	17
---------------------------------------------------------------------------------------------------------------------------	----

Table 3

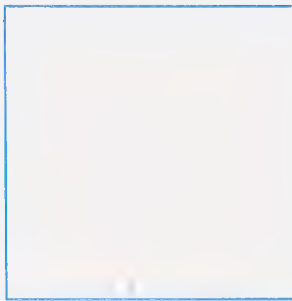
Types of Noise Complaints Received 2/1/95 - 8/31/95	43
-----------------------------------------------------------	----

Table 4

Noise Complaint Response Procedure	44
------------------------------------------	----

Table 5

Community Condition Indicators	52
--------------------------------------	----



EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

Introduction

Noise is a significant and inherent part of Sunnyvale's environment. The noise environment is a result of historical land use decisions, competing regional and community goals, geographic reasons and limited local controls. The City's residents and businesses must tolerate some noise. Excessive noise, however, can cause physical and mental health problems. A legitimate public concern is, therefore, to protect residents from excessive noise.

Acceptable levels of noise vary from land use to land use. Both the state and federal government have developed guidelines for evaluating the compatibility of various land uses with noise. The federal government has prepared noise and land use compatibility guidelines for air bases. The state guidelines were originally developed in 1976 and presented in a document titled *Guidelines for the Preparation of the Noise Element in the General Plan*. These guidelines have been periodically updated since then.

Transportation facilities are Sunnyvale's main source of noise, and the most difficult to control. Roadways are the major source of transportation noise, followed by Moffett Federal Airfield, the CALTRAIN corridor and San Jose International Airport. Year 2010 predicted noise levels are depicted in the Noise Condition Map in Appendix A.

Noise from land use operations and single-events, such as air conditioners and leaf blowers, are an ongoing concern. These noise problems are discussed generally in this Sub-



Roadways are the major source of transportation noise.



Element. Land Use operational noise and some single-event noises are regulated by the Sunnyvale Municipal Code.

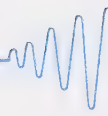
Purpose

The Noise Sub-Element is both a problem statement and an integrated set of goals, policies and actions. The Noise Sub-Element describes the noise environment in Sunnyvale and identifies strategies for living with noise. The strategies will guide decision makers confronted with issues and proposals. The fundamental purpose of the Noise Sub-Element is to:

- provide information on the current and future noise environment in Sunnyvale so that noise can be effectively considered in the land use planning process;
- preserve areas within Sunnyvale that have an acceptable noise environment;
- describe cost effective strategies for abating excessive noise in the community; and
- utilize the Noise Condition Map of the Sub-Element to identify areas that require further study and mitigation measures to comply with State Noise Insulation Standards.

The Noise Sub-Element is both a problem statement and an integrated set of goals, policies and actions.

The Noise Sub-Element is one of 24 sub-elements in Sunnyvale's General Plan. Its goals and policies must be considered in the context of other local goals. The Noise Sub-Element shares a particularly close relationship with the Land Use and Transportation Element. The land use portion of the Land Use and Transportation Element describes the location, type and intensity of land use activities in Sunnyvale. These activities generate and receive noise. The Noise Sub-Element identifies noise issues caused by land use and addresses those issues with policies and action statements. The transportation portion of the Land Use and Transportation Element lays out the City's street,

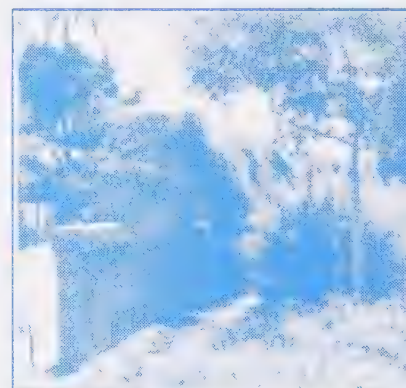


expressway and freeway system. These facilities along with aircraft and trains are the main source of noise in Sunnyvale. The Noise Sub-Element identifies noise issues that result from transportation and suggests ways to address them.

Major Findings

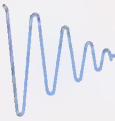
The following findings are based on the Community Conditions section and they form the basis of the goals, policies and action statements in this Sub-Element.

1. State and federal noise guidelines and standards have proven to be reasonable for determining land use compatibility with the noise environment. Most existing and future land uses in Sunnyvale comply with these standards and guidelines.
2. Major roadways cause most of the ambient noise in Sunnyvale. In 1986, before sound walls were installed, approximately 41% (8,630 homes) of single-family homes experienced “conditionally acceptable”¹ noise levels (60-75 dBA Ldn) and 1% (270 homes) of single-family homes experienced “unacceptable” noise levels (greater than 75 dBA Ldn) resulting from roadway noise. Between the years 1986 and 1996, sound walls were completed along Interstate 280, U.S. Highway 101, State Highway 85 and along many major local roadways, substantially reducing noise levels in communities near those roadways. Based on roadway traffic projections, there are no significant changes (3 dBA or greater) expected to occur between the years 1996 and 2010 in Sunnyvale as a result of roadway noise. In the year 2010, the percentage of single-family homes experiencing “conditionally



Between the years 1986 and 1996, sound walls were completed along Interstate 280, U.S. Highway 101, State Highway 85 and along many major local roadways, substantially reducing noise levels in communities near those roadways.

¹ For definitions of “normally acceptable”, “conditionally acceptable” and “unacceptable”, see Table 2, page 13 of the *State of California Noise Guidelines for Land Use Planning, Summary of Land Use Compatibility for Community Noise Environment*.



acceptable" noise levels is predicted to be 20% (5343 homes). The percentage of homes experiencing "unacceptable" noise levels is predicted to be less than .1% (24 homes) in the year 2010.

3. Despite the traffic noise, noise levels are "normally acceptable"² for most homes today, and most homes will continue to have normally acceptable noise levels in the future. Non-residential uses will generally be unaffected by current and future traffic noise.
4. The major roadway noise contributors to residential areas in Sunnyvale are the freeway system, Mathilda Avenue, Wolfe Road, Lawrence Expressway, El Camino Real and Homestead Road. Although Mary Avenue, Hollenbeck Road, Fremont Avenue, and Remington Drive are relatively quiet roads, they do subject a large number of residences to some noise exposure. Since Central Expressway is mostly below grade, it is not considered a substantial noise contributor. Because sound walls have been installed along Sunnyvale-Saratoga Road, this roadway is not considered a major noise contributor to residential areas.
5. The future use of Moffett Federal Airfield will have a significant effect on the noise environment in Sunnyvale. The City does not have authority to determine what the National Aeronautic and Space Administration (NASA) may ultimately decide to do with the future use of Moffett Federal Airfield. The City has adopted policies to define the City's interest regarding Moffett Field and what means the City will use to influence federal decision makers to adopt policies and/or undertake



Noise levels of individual aircraft events will eventually stabilize and decrease as Stage 3 (quieter aircraft) become prevalent.

² Ibid.

activities compatible with the City's defined interests.

6. Residents in northeast Sunnyvale are affected by San Jose International Airport flight patterns. Operations have doubled since 1985 and are forecasted to more than double again between 1995 and 2010. Noise levels of individual aircraft events will eventually stabilize and decrease as Stage 3 (quieter aircraft) become prevalent. Current and forecasted future noise levels are below state limits.
7. Commuter and other train operations affect noise levels in central Sunnyvale. Current noise levels are acceptable for all but older homes near the tracks. Future noise levels may noticeably increase, thereby worsening the environment of those homes. State and local noise standards can protect new residential uses from excessive noise levels. Current and future train noise levels are generally acceptable for nonresidential uses.
8. Noise from land use operations (air conditioners, loading docks, etc.) is regulated by the Municipal Code and discretionary land use permits. An October 1995 -review (RTC No. 95-402 "Noise Ordinance Review") determined that operational noise regulations are effective.
9. The Sunnyvale Municipal Code regulates some single-event noises such as nuisance animal noises (barking dogs), delivery hours of commercial or industrial establishments that are adjacent to residential zoning districts, and hours of operation of powered equipment (such as leaf blowers) that are adjacent to residential zoning districts. The City, however, cannot regulate all single-event noises and



Commuter and other train operations affect noise levels in central Sunnyvale.



usually mediates complaints by relying on generally stated public disturbance regulations.

10. Barriers, setbacks, site planning and building design practices are useful techniques for reducing the impact of noise. Each technique has benefits and shortcomings.

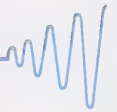
Summary of Goals and Policies

This section lists the goals and policies contained in this Sub-Element. The goals and policies as well as the supporting action statements are included in the section titled *"Goals, Policies and Action Statements of the Noise Sub-Element"* on pages 53 - 63 of this Sub-Element.

GOAL 3.6A

MAINTAIN OR ACHIEVE A COMPATIBLE NOISE ENVIRONMENT FOR ALL LAND USES IN THE COMMUNITY (LAND USE COMPATIBILITY).

- | | |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Policy 3.6A.1 | Prevent significant noise impacts from new development by applying state noise guidelines and Sunnyvale Municipal Code noise regulations in the evaluation of land use issues and proposals. |
| Policy 3.6A.2 | Enforce and supplement state laws regarding interior noise levels of residential units. |
| Policy 3.6A.3 | Consider techniques which block the path of noise and insulate people from noise. |



GOAL 3.6B

PRESERVE AND ENHANCE THE QUALITY OF NEIGHBORHOODS BY MAINTAINING OR REDUCING THE LEVELS OF NOISE GENERATED BY TRANSPORTATION FACILITIES (TRANSPORTATION NOISE).

- | | |
|---------------|----------------------------------------------------------------------------------------------------------|
| Policy 3.6B.1 | Refrain from increasing or reduce the noise impacts of major roadways. |
| Policy 3.6B.2 | Support efforts to reduce or mitigate airport noise. |
| Policy 3.6B.3 | Support activities that will minimize the noise impacts of Moffett Federal Airfield. |
| Policy 3.6B.4 | Support activities that will minimize and/or reduce the noise impacts of San Jose International Airport. |
| Policy 3.6B.5 | Encourage activities that limit the noise impacts of helicopters. |
| Policy 3.6B.6 | Mitigate and avoid the noise impacts from trains. |
| Policy 3.6B.7 | Monitor and mitigate the noise impacts of light rail facilities. |

GOAL 3.6C

MAINTAIN OR ACHIEVE ACCEPTABLE LIMITS FOR THE LEVELS OF NOISE GENERATED BY LAND USE OPERATIONS AND SINGLE-EVENTS (COMMUNITY NOISE).

- | | |
|---------------|---------------------------------------------------------------------------------------------------|
| Policy 3.6C.1 | Regulate land use operation noise. |
| Policy 3.6C.2 | Regulate select single-event noises and periodically monitor the effectiveness of the regulations |





COMMUNITY CONDITIONS

COMMUNITY CONDITIONS

Introduction

Noise is unwanted sound. Sounds become unwanted when they disrupt the ability to talk, listen, learn, work, relax or sleep. Noise is an inherent part of urban life. At best, it is a minor irritant. At worst, it causes physical harm such as hearing loss, ulcers, high blood pressure and heart disease. It can also cause tension, frustration, violence and other mental health problems.

TYPES OF NOISES

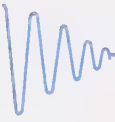
Basic types of noise are:

Ambient Noise - A relatively steady background noise which is an accumulation of different noise sources near and far. Most ambient noise in Sunnyvale is related to transportation. Other ambient noise sources include wind and chirping birds.

Single-event Noise - An unusual, occasional or temporary noise. Examples include:

- barking dogs
- loud stereos
- deliveries
- parking lot sweepers
- shouting
- construction work
- organized athletic, musical or other group events
- power equipment such as lawn mowers, leaf blowers and workshop tools

*Noise is an inherent part
of urban life.*



- burglar and fire alarms
- ice cream trucks
- handling of garbage cans
- emergency vehicles.



An air conditioner is an example of a continuous noise emitter related to the basic use of property.

Land Use Operational Noise - A continuous or frequent noise related to the basic use of property. Examples include:

- air conditioners
- loading docks
- pool pumps and filters
- restaurant loudspeakers
- roof equipment
- industrial machinery.

The discussion of noise in this Sub-Element as it relates to Sunnyvale is divided in two categories: transportation and community noise. Transportation noise, generated by roadway, aircraft, train and light rail facilities; is a major contributor to ambient noise in Sunnyvale. Community noise is considered to be everything other than transportation-related noise; and includes single-event and land use operational noise.

MEASURING NOISE

Sounds are measured in decibels (dB). The decibel scale is logarithmic with the following characteristics:

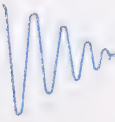
- a change of 1dB cannot generally be heard;
- a change of 3dB is a just noticeable difference;
- a change of 5dB is distinct;
- a change of 10dB is heard as a doubling of noise (e.g., 70dB is twice as loud as 60dB);
- combining two noises of the same decibel level will add 3dB to the resulting noise (e.g., two noises at 60dB add up to 63dB, not 120dB);

- combining two noises of different decibel levels will add less than 3dB to the loudest noise; and
- continued exposure to noise above 70dB may impair hearing.

Table 1 shows the decibel levels of common sounds.

Table 1 - Decibel Levels of Common Sounds

Noise Source (distance between source and listener)	Sound Level (dBA)	Subjective Impression
Civil Defense Siren (100')	130	Threshold of Pain
Jet Takeoff (200')	120	
Rock Music Concert	110	
Bus (15') Ambulance Siren (100')	100	Very Loud
Boiler Room Printing Press Plant	90	
Garbage Disposal (3') Freeway (100')	80	
Freight Cars (100')	70	Moderately Loud
Vacuum Cleaner (10') Department Store Speech (1')	60	
Light Traffic (100') Business Office	50	
Typical Home Interior; Typical Home Exterior, Nighttime	40	Quiet
Quiet Bedroom Soft Whisper (5')	30	
	20	
Mosquito (5')	10 5	Threshold of Hearing



Instantaneous Noise Measurements

To measure environmental noise at any instant in time, acoustical engineers have used A and C weighted filters for approximately 30 years. The weighted measurements determine the "loudness" of a sound which is detected by the human ear. The A-weighted filter registers low, mid and high frequency noises associated with interference, loudness, community impact studies, and speech. The C-weighted filter is used when measuring impulsive sound such as artillery fire, explosions, quarry blasts and demolitions. Sunnyvale currently uses the dBA rating to enforce the noise regulations.



A sound level meter is used to take an instantaneous decibel reading.

A sound level meter is used to take an instantaneous decibel reading. The resultant reading is the sound level (dBA) for an instant in time. Instantaneous decibel readings are required for all the noise descriptors discussed in this Sub-Element. In the case of the statistical descriptors and the day-night average sound level, numerous instantaneous readings are averaged over a stated period of time.

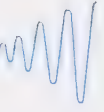
Instantaneous Noise Measurements and the Sunnyvale Municipal Code Noise Regulations

The maximum decibel levels for operational noise in the noise regulations of the Sunnyvale Municipal Code refer to instantaneous noise readings (as opposed to average noise Ldn readings). For the purpose of enforcing the noise regulations in the Sunnyvale Municipal Code, one or more instantaneous decibel readings are taken, usually at the property line of the property generating the noise.

MEASURING NOISE OVER A STATED PERIOD OF TIME

Measuring Daytime and Nighttime Noise

Noise levels are relatively constant from moment to moment, but change slowly from hour to hour. To account for human sensitivity to nighttime noise levels, noise descriptors have been developed that penalize sounds occurring in the evening and/or nighttime hours. Ldn and CNEL are two of



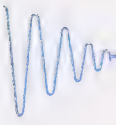
the most common noise descriptors that average noise levels over a 24-hour period. The CNEL descriptor is more sensitive to evening noise than Ldn. However, CNEL and Ldn result in almost identical readings. An Ldn reading can therefore be compared to a CNEL reading.

Ldn (day/night average sound level): The A-weighted average sound level in decibels during a 24-hour period. The 24-hour period is divided into daytime (7am - 10pm) and nighttime (10pm - 7am) periods. A 10 dBA penalty is applied to nighttime noise. The Ldn descriptor is used for all the noise measurements taken to develop the noise contours in the Year 2010 Noise Condition Map of this Sub-Element in Appendix A.

CNEL (Community Noise Equivalent Level): represents the A-weighted average continuous noise level in decibels over a 24-hour period. The 24-hour day is divided into three time periods: daytime (7am to 7 pm), evening (7pm to 10pm) and nighttime (10pm to 7am). A 5 dB penalty is applied to evening noises. A 10 dB penalty is applied nighttime noises. The State of California Aeronautics Law requires that CNEL be used for measuring noise contours around airports; therefore, CNEL is used for measuring potential airport noise for the Noise Contour Map in this Sub-Element in Appendix B.

Statistical Descriptors

To describe the time-varying character of environmental noise, the statistical descriptors L_{10} , L_{50} , and L_{90} are commonly used. They are the noise levels equaled or exceeded during 10%, 50% and 90% of the stated time period. A single number descriptor called L_{eq} is also widely used. The L_{eq} is the average noise level during a stated period of time. The hourly L_{eq} is used to develop the 24 hour Ldn. The acoustical studies that have been prepared for the City for specific sites use these descriptors to describe the existing and potential noise generated on the site over stated time periods.



REGULATING NOISE

What level of noise are people expected to tolerate in a residential, commercial or industrial environment?

Residential uses are the most sensitive. Industrial uses are the most tolerant. Tolerance also depends on how loud the noise is, when and where it happens, the duration, frequency and tone of the noise, and the sensitivity of the person who hears the noise. People are generally most tolerant of existing ambient noise. They are least tolerant of single event noise, operational noise, and increases in ambient noise.

Noise regulations vary by land use due to different sensitivities to noise.

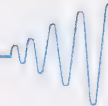
It isn't possible or reasonable to control all noises to which some people may object. However, a legitimate public concern is to protect people from excessive noise. Many communities respond to this issue by regulating noise through the community's municipal code. Noise regulations vary by land use due to different sensitivities to noise. Communities use noise regulations as guidelines for checking the compatibility of a particular use with existing and future noise levels. Noise regulations vary from community to community due to different development patterns, geography and priorities.

Excessive noise can be regulated at any of three stages:

- (1) reduce the **source** of noise;
- (2) block the **path** of noise, and
- (3) insulate or remove the **receiver** of noise.

There are opportunities to improve some noise conditions, prevent others from getting worse, and protect acceptable noise conditions. However, the City's ability to protect people from excessive noise is restricted for the following reasons:

- Decisions made 30 - 50 years ago transformed Sunnyvale from an agricultural community into a military, aerospace and industrial center with transportation, housing and commercial support systems. These land use decisions resulted in a mix and intensity of urban activities and facilities which are inherently noisy.

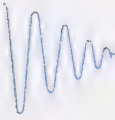
-
- 
- Protection from noise has generally been a lower priority than competing community goals, such as free-flowing traffic and more housing.
 - Geography makes Sunnyvale a natural "crossroads" for South Bay traffic and its resulting noise (several State roads and highways, and county expressways traverse Sunnyvale).
 - Sunnyvale has limited local control over transportation noise, the major source of noise in Sunnyvale.

Regulating noise is an intergovernmental issue. Federal, state and local governments share the responsibility for regulating noise. Understanding the powers of each level of government will help the City of Sunnyvale understand its capabilities of influencing control over the noise environment in Sunnyvale.

Federal Authority

Federal Aviation Regulations (FAR), Part 150 - Airport Noise Compatibility and Land Use Planning

The Federal Aviation Administration (FAA) has established the Federal Aviation Regulations (FAR) Part 150 to address noise at civilian airports. FAR Part 150 specifically addresses airport noise compatibility planning. These regulations prescribe the procedures, standards, and methodology governing the development, submission, and review of airport noise exposure maps and airport noise compatibility programs, including the process for evaluating and approving projects related to those programs. FAR Part 150 directs that noise contours for airports be developed using the FAA's Integrated Noise Model (INM) for developing standardized noise exposure maps and predicting noise impacts. The agency must identify incompatible land uses within the noise contours. FAR Part 150 review often leads to operational changes in a project to minimize or mitigate impacts.



Air Installation Compatible Use Zone (AICUZ) Study

In 1976, when the Navy operated Moffett Field, the U.S. Department of Defense prepared guidelines which identify suitable land uses in an area impacted by high noise and potential accidents. The guidelines are part of an Air Installation Compatible Use Zone (AICUZ) study. Noise contours were updated in 1982. The AICUZ Map displays federal guidelines for land uses near the Naval Air Station (NAS) at Moffett Field. Since the Navy no longer operates Moffett, the AICUZ study is considered an informational document. The complete AICUZ study and map can be reviewed at the City of Sunnyvale, Department of Community Development.

Guidelines for Considering Noise in Land Use Planning and Control

In June of 1980, the Federal Interagency Committee on Urban Noise published the *"Guidelines for Considering Noise in Land Use Planning and Control"*. The Interagency Committee was comprised of the five federal agencies most involved in noise, land use, or environmental policy: Department of Defense, Transportation, Housing and Urban Development, the Veterans Administration and the Environmental Protection Agency.

Trains

The Environmental Protection Agency (EPA) regulates noise levels of trains.

Roadways

The EPA regulates roadways where federal funding is involved or environmental review is required.

State Authority

Noise Guidelines for Land Use Planning

In 1976, the State of California published guidelines for noise compatible land use planning. Generally, exterior noise exposures fall into four categories: normally acceptable, conditionally acceptable, normally unacceptable and unacceptable. Each land use has a particular dBA range within each exterior noise exposure category. Table 2 on page 17 of this Sub-Element summarizes these



guidelines. The City has not adopted these guidelines but does consider them in land use planning. Generally, the state guidelines have proven to be reasonable guidelines for determining land use compatibility.

**Table 2 - State of California Noise Guidelines for Land Use Planning
Summary of Land Use Compatibility for Community Noise Environment**

Land Use Category	Exterior Noise Exposure LDN or CNEL, DBA					
	55	60	65	70	75	80
Residential, Hotels and Motels						
Outdoor Sports and Recreation, Neighborhood Parks and Playgrounds						
Schools, Libraries, Museums, Hospitals, Personal Care, Meeting Halls, Churches						
Office Buildings, Commercial and Professional Businesses						
Auditoriums, Concert Halls, Amphitheaters						
Industrial, Manufacturing, Utilities and Agriculture						



Normally Acceptable

Specified land use is satisfactory, based on the assumption that any buildings involved are of normal conventional construction, without any special insulation requirements.

Conditionally Acceptable

Specified land use may be permitted only after detailed analysis of the noise reduction requirements and needed noise insulation features are included in the design.

Unacceptable

New construction or development should generally not be undertaken because mitigation is usually not feasible to comply with noise element policies.



Noise Insulation Requirements (Title 24)

The California Code of Regulations protects interiors of new multi-family dwellings from excessive noise. These requirements apply to hotels, motels, townhomes, condominiums, apartments, group care homes, and all other dwellings except single-family detached homes. The law requires that:

- Interior noise levels cannot exceed an Ldn of 45dB with doors and windows closed; and,
- A residential site with an Ldn above 60dB needs a detailed noise study. The study must show how the dwelling will meet an interior Ldn of 45dB.

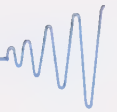
Note: Ldn is a time weighted average and is not comparable to an instantaneous decibel reading. See page 10 in this Sub-Element containing the section titled "*Measuring Noise Over a Stated Period of Time*".

The City enforces Title 24 and also has the ability to impose its requirements on new single-family dwellings. A decision to do so could be adopted in conjunction with this Sub-Element.

Title 24 regulates average sound levels, not individual events. For residential units exposed to train or aircraft noise, the City could limit the interior noise level exposure of periodic loud events (train passbys and overhead aircraft). For instance, the City can adopt a maximum instantaneous noise level of 50dBA in bedrooms and 55dBA in other rooms.

Noise Element

California Government Code requires each city and county to prepare a Noise Element as part of the General Plan. Sunnyvale's first Noise Element was adopted in 1972. It was revised in 1986 and was subsequently called the "Noise Sub-Element" and included within the Environmental Management Element of the General Plan.



California Airport Noise Standards

According to the State Airport Noise Standards, the level of noise acceptable to a "reasonable" person residing in the vicinity of an airport is CNEL 65dBA. This criterion was chosen for persons residing in urban residential areas where houses are of typical California construction and may have windows partially open. The CNEL 65dBA level was selected with reference to speech, sleep and community reaction. The stated purpose of these standards is to provide a basis for resolving an existing noise problem in communities surrounding civil airports and to prevent the development of new noise problems. (Note: Military airports are not subject to the regulation. In addition, military aircraft operations are not counted when making a statutory determination of whether or not an airport is a "noise problem" airport. Moffett Federal Airfield is not subject to these standards but the standards do apply to San Jose International Airport.). All existing and future civil airports in California are subject to the regulation.

Environmental Review (CEQA)

The California Environmental Quality Act (CEQA) requires that both private and public actions be evaluated for potential environmental impacts, including noise.

Disturbance Noise

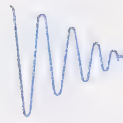
When the City of Sunnyvale, Public Safety Department receives a noise complaint that is not explicitly covered by the Sunnyvale Municipal Code, the person perpetrating the noise can be cited under California Penal Code, Section 415(2). A citation could occur if an officer determines that the noise is done willfully and maliciously and if the noise is loud and unreasonable. The noise is often referred to by the Public Safety Department as "disturbing the peace".

Motor Vehicles

The State Vehicle Code requires motor vehicles to conform to specified noise regulations. Sunnyvale continues to enforce state muffler laws. The State Vehicle Code also specifies how loud a person's car stereo can play at a distance of 50 feet. The City cannot set noise limits for cars, trucks, motorcycles, off-road vehicles, trains or aircraft.



The City cannot set noise limits for cars, trucks, motorcycles, off-road vehicles, trains or aircraft.



Sunnyvale could choose to support legislation to reduce vehicle noise levels.

Occupational Noise

The California Occupational Safety and Health Act protects employees from industrial and equipment noise.

County Authority

Airport Land Use Commission (ALUC)

The Santa Clara County Airport Land Use Commission consists of seven members, seven alternates and two ex-officio members. Commissioners are appointed by the legislative bodies of the cities within Santa Clara County (including Sunnyvale) and by the County of Santa Clara. The ALUC prepares an Airport Land Use Commission Plan that provides for orderly growth of the area surrounding each public airport in Santa Clara County (San Jose International Airport, Palo Alto Airport, Reid-Hillview Airport, and South County Airport). The Plan is intended to minimize the public's exposure to excessive noise and safety hazards. The ALUC has established provisions for regulating land use, building height, safety and noise insulation within these areas that are adjacent to each of the airports ("referral boundaries"). The City of Sunnyvale is not within an ALUC referral boundary.

The ALUC also reviews the general and specific plans prepared by local agencies (including Sunnyvale) for consistency with the ALUC plan. Recommendations made by the ALUC are advisory in nature to the local jurisdictions, not mandatory.

Sunnyvale Authority

Noise Ordinance

Chapter 19.24 (Operating Standards) of the Sunnyvale Municipal Code contains the City's Noise Standards. The noise standards were adopted in 1963 and revised in 1995. The noise regulations pertain to operational noise, hours of operation of powered equipment and delivery hours for commercial and industrial businesses adjacent to properties with residential zoning. Other single-event noises such as

construction, loudspeaker, nuisance and animal noises are regulated by different sections of the Municipal Code (see below) or by State Law.

Operational Noise

The Sunnyvale Municipal Code, Section 19.24.020(b) regulates operational noise. The section states:

- Operational noise shall not exceed 75dBA at any point on the property line of the premises upon which the noise or sound is generated or produced; provided, however, that the noise or sound level shall not exceed 50dBA during the nighttime or 60dBA during daytime hours at any point on adjacent residentially zoned property. If the noise occurs during the nighttime hours and the enforcing officer has determined that the noise involves a steady, audible tone such as a whine, screech or a hum, or a staccato or intermittent noise (e.g., hammering) or includes music or speech, the allowable noise or sound level shall not exceed 45dBA.

Daytime / Nighttime Hours

The Sunnyvale Municipal Code defines daytime as the period from 7am to 10pm, daily, and nighttime as the period from 10pm to 7am daily.

Powered Equipment

Powered equipment is defined in the Sunnyvale Municipal Code as:

- a motorized device powered by electricity or fuel used for construction, demolition, property or landscape maintenance, and repairs. Powered equipment includes but is not limited to: lawn mowers, edgers, leaf blowers, parking lot sweepers, saws, sanders, motors, pumps, generators, blowers, fans, wood chippers, vacuums, and nail guns.



The Sunnyvale Municipal Code limits the use of powered equipment that is used on a temporary, occasional or infrequent basis to daytime hours when used on a property that is adjacent to a residentially zoned property.

The Sunnyvale Municipal Code limits the use of powered equipment that is used on a temporary, occasional or infrequent basis to daytime hours (7am to 10pm, daily) when used on a property that is adjacent to a residentially zoned property.

Deliveries

The Sunnyvale Municipal Code regulates deliveries to commercial and industrial establishments that are adjacent to residentially zoned property to daytime hours (7am to 10pm, daily). This requirement is imposed on all businesses established or relocated after February 1, 1995. "Deliveries" include the use of motorized vehicles other than automobiles or trains.

Nuisance Regulations

The nuisance regulations in Chapter 19.24 of the Sunnyvale Municipal Code states in general terms that the owner or occupant of a property shall not permit any activity which creates a nuisance. "Noise" is listed as one of the several ways to create a nuisance.

Construction Noise

Hours of construction are regulated by the administrative provisions of the Uniform Building Codes, which Sunnyvale adopts by reference every three years. See Sunnyvale Municipal Code Chapter 16.08.

Loudspeaker Noise

Sunnyvale Municipal Code, Section 9.48.010 regulates the hours of operation of sound from loudspeakers projecting out of buildings.

Animal Noises

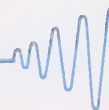
Sunnyvale Municipal Code, Section 6.16.015(b) states that it is unlawful for any person to keep an animal that becomes a nuisance (including dogs that bark repeatedly).

Land Use Decisions

The City of Sunnyvale exercises indirect noise control through land use and transportation planning, and direct control through the zoning code requirements. Decisions about the type, location and intensity of land uses affect the



Sunnyvale Municipal Code states that it is unlawful for any person to keep an animal that becomes a nuisance (including dogs that bark repeatedly).



amount of noise generated and the kinds of transportation facilities needed to support those uses. Decisions about roadway location, design, capacity and traffic management techniques all affect noise levels. Competing community goals need constant evaluation to determine the most appropriate balance of land use and transportation decisions.

Discretionary Land Use Permits

During the review of a discretionary land use permit, staff may determine that there are noise issues associated with a proposed project. Staff may require that the applicant arrange for a professional acoustical engineer to conduct a study of the potential noise impacts from the development or of existing noise on the development and potential mitigation measures that may be appropriate. The scope of this study needs to assure sufficient time and reasonable locations for acoustical readings.

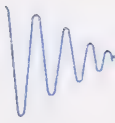
Discretionary land use permits issued by the City can contain conditions of approval relating to noise mitigation that minimize the noise impacts of a use on an adjacent property. Examples of noise mitigation techniques include: zoning district setbacks; berms; landscaping; sound walls; incorporating noise mitigation materials into the design of a building and limiting the hours of operation, deliveries, and parking lot sweeping; and limiting or prohibiting the use of loudspeakers on a property.



Examples of noise mitigation techniques include the use of berms.

Advocacy

Sunnyvale can advocate noise protection in the land use and transportation plans and projects of neighboring cities, the County, and state and federal agencies. Of particular need is to monitor the noise impacts and mitigation of potential roadway improvement plans.



Overview of Sunnyvale Noise Conditions

Transportation noise from cars, trucks, buses, aircraft and trains are the major sources of noise in Sunnyvale. Transportation noise causes "conditionally acceptable" and "unacceptable" (as defined by the "State Noise Guidelines for Land Use Planning", see Table 2 of this Sub-Element) noise levels in many parts of the City.

Despite the exposure that Sunnyvale residents have to transportation noise, most existing and future land uses comply with current state guidelines and federal noise standards.

In addition to transportation noise, single-event and operational noises (community noises) are frequent. Despite the exposure that Sunnyvale residents have to transportation noise, most existing and future land uses comply with current state guidelines and federal noise standards. These guidelines and standards are discussed in the "Regulating Noise" section of this Sub-Element. Existing and potential future noise conditions from transportation, single-event and operational noises are discussed in detail below.



Noise Condition Map

The Noise Condition Map for Sunnyvale consists of two, superimposed maps (see Appendix A).

Noise Exposure Map - To develop the Noise Exposure Map, the Ldn was measured at a distance of 50 feet from the edge of all the major roadways. The roadway was then color-coded depending on the outcome of the measurement. The Noise Exposure Map is a convenient visual aide in determining the level of noise resulting from roadway traffic and can assist in making land use decisions.

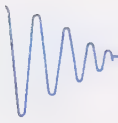
Noise Contour Map - Shows noise contours for the year 2010 for major roadway and railroad noise sources in Sunnyvale. The noise contours represent **average**³ noise levels over a 24-hour period. Noise levels at any instant may be higher or lower.

The base map for the Noise Condition Map is on a Geographic Information System (GIS) map of the City. The GIS base map is connected to a data base which indicates land use, zoning and general plan designation for each land parcel in Sunnyvale. Using the GIS as a base map for the Noise Condition Map facilitates an accurate count of land parcels exposed to various noise levels. Prior versions of the Noise Condition Map did not use the GIS system for the base map.

The Noise Condition Map can be used to:

- identify areas where existing uses are impacted by excessive noise;
- determine if future land uses are compatible with their noise environments. If the use would be exposed to excessive noise, the City could require a detailed noise study (the Noise Condition Map does not take the place of a detailed study) that

³ The Noise Contour Map consists of average (Ldn) noise levels whereas instantaneous readings are used for the purpose of enforcing the noise regulations in the Sunnyvale Municipal Code.



shows existing and future noise levels and recommends ways to achieve acceptable noise levels; and

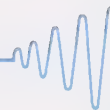
- implement Title 24 of the California Code of Regulations (Noise Insulation Requirements).

TECHNICAL REPORT FOR NOISE CONDITION MAP

A technical report which includes the methodology and data used to develop the Noise Condition Map is available for review at the Department of Community Development. The report includes survey techniques; noise monitoring locations, times, and data; traffic data used to develop the noise contours; and a table of noise exposure to single-family residences by noise source. The number of single-family homes exposed to various noise levels was counted using the GIS database. More than 50% of a single-family land parcel had to be included within the noise contour before it was included in that particular noise level category. Multi-family residences were not tabulated for noise exposure by noise source because of the difficulty in determining how many units in a building are exposed to a particular noise source. For example, a two-story, 24 unit apartment building may have as few as four, or as many as 12 units exposed to a noise source, depending on the arrangement of building(s) on the site. In addition, sound walls typically required for multi-family developments mitigate the noise exposure on the property.

METHODOLOGY USED TO DEVELOP THE NOISE CONTOUR MAP

The noise contours were developed based on existing and predicted year 2010 traffic conditions for major roadways in Sunnyvale, and calibrated with noise measurements taken in June 1996. The City's Traffic Engineering Division provided existing and predicted year 2010 average daily trip data for major roadways in Sunnyvale. Average daily trip data, in combination with speed limits, is used to establish Ldn distances (60, 65, and 70) from the centerline of the



each major roadway. The short and long-term noise measurements are then used to calibrate and verify the contour distances resulting from the traffic data information.

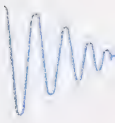
NOISE MEASUREMENT LOCATIONS

Noise measurements were taken to develop the Noise Condition Map, and consisted of four long-term (24 hour) at the following locations:

- near the CALTRAIN railroad tracks (Evelyn Avenue near Sunset Avenue);
- near State Highway 85 (The Dalles and Bernardo Avenue);
- along Wolfe Road (near Elizabeth Way); and
- near Lawrence Expressway (near Sandia Avenue).

In addition, 16 short-term (10-15 minute) noise measurements were taken between the hours of 9:00am and 5:30pm at the following locations:

- corner of Bryan and Bayview Avenues;
- near Central Expressway and Sunnyvale Avenue along Arques Avenue;
- Mary Avenue, between Evelyn and Fremont Avenues;
- Sunnyvale-Saratoga Road, between El Camino Real and Fremont Avenue;
- South Mary Avenue, between Fremont Avenue and Homestead Road;
- Kennewick Drive, near Homestead Road;
- Fremont Avenue at La Bella Avenue;
- Homestead Road, between Hollenbeck Avenue and Sunnyvale-Saratoga Road;
- Homestead Road, between Wolfe Road and Sunnyvale-Saratoga Road;
- Sunnyvale-Saratoga Road south of Harwick Way;
- Silverlake Dive at Lakedale Way;
- Lakedale Way near Lawrence Expressway;
- Lakewood Drive near U.S. Highway 101;
- Caribbean Drive near the sewage treatment plant;

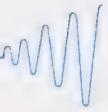


- Sandia Avenue and Wildwood Avenue, near U.S. Highway 101; and
- San Rafael Street and East Ahwanee Avenue, near U.S. Highway 101.

MOFFETT FEDERAL AIRFIELD - POTENTIAL NOISE CONDITIONS FOR YEAR 2010

Potential future noise impacts of Moffett Federal Airfield (MFA) are shown in Appendix B, *"Mitigated Year 2010 Forecast Noise Exposure Conditions (CNEL)"*. The potential noise impacts are based on the mitigated 2010 forecast of aircraft operations contained in the Comprehensive Use Plan (CUP) developed by NASA in 1994. The mitigation measures include removing noisy helicopters from the fleet mix, modifying the helicopter flight patterns, and runway usage and noise attenuation for new or modified wind tunnels that would result in less-than- significant noise impact levels. The CUP is discussed in the *"Regulating Noise at Moffett Federal Airfield"* section of this Sub-Element.

The noise contours in Appendices A and B show Ldn contours for roads and the railroad, and CNEL contours for Moffett Federal Airfield. Why use both noise descriptors? The national trend is to use Ldn to describe average noise levels, but California law requires CNEL for airports. Since Ldn and CNEL readings are almost identical, they are interchangeable.



Transportation Noise

Transportation noise causes most of the ambient noise in Sunnyvale. It is the most difficult noise to control and regulate. This discussion of transportation noise focuses on traffic, aircraft, train and light rail noise issues.

The major noise contributors to residential areas in Sunnyvale are all transportation-related: the freeway systems, Mathilda Avenue, Wolfe Road, Lawrence Expressway, El Camino Real and Homestead Road, the CALTRAIN Railroad and Moffett Federal Airfield. Although Mary Avenue, Hollenbeck Road, Fremont Avenue, and Remington Drive are relatively quiet roads, they do affect a large number of residences. Sunnyvale-Saratoga Road is not considered a major noise contributor to residential areas because sound walls have been installed that protect the homes along this roadway from excessive noise exposure. Since Central Expressway is mostly below grade, it is not considered a substantial noise contributor.



The major noise contributors to residential areas in Sunnyvale are all transportation-related.

TRAFFIC NOISE CONDITIONS

Major roadways cause most of the transportation noise in Sunnyvale. Sunnyvale has an interstate, three highways, two expressways, and numerous arterial and collector streets within its borders. Virtually all existing homes next to freeways and expressways are protected by sound walls or depressed grades.

The Noise Condition Map in Appendix A shows noise levels adjacent to the major roadways. All major roadways in Sunnyvale have an Ldn of at least 60dB. Ldns between 60-75 dBA are defined as "conditionally acceptable" by the State Noise Guidelines for Land Use Planning (see Table 2). In 1986, approximately 40% (8630) of single-family homes were exposed to "conditionally acceptable" noise levels. In the year 2010, this percentage is predicted to decrease to 20%, or 5343 single-family homes (based on ABAG dwelling unit projections and 2010 noise predicted conditions). A Ldn above 75dBA is considered to be "unacceptable" for



Due to the lack of alternative locations, most new residential projects are being developed near major roadways.


residential uses by the State Noise Guidelines because prolonged exposure may cause hearing damage. In 1986, before sound walls were installed, 1% (270) of single-family homes were exposed to "unacceptable" noise levels. The number of single-family homes exposed to various noise levels was counted using the GIS database. More than 50% of a single-family land parcel had to be included within the noise contour before it was included in that particular noise level category. In the year 2010, this percentage is predicted to be reduced to less than .1%, or 24 single-family homes (based on ABAG dwelling unit projections and 2010 predicted noise conditions). Traffic noise is generally not an issue for commercial, office and industrial uses.

Despite the traffic noise, noise levels in residential areas are acceptable for most existing homes. The quietest places in Sunnyvale are the centers of residential neighborhoods. A noise level of 50 dBA Leq was measured over a 15-minute period in daytime hours in a quite neighborhood in southern Sunnyvale. However, relatively quiet streets can be impacted by single-event noises such as faulty mufflers, racing engines, and squealing tires or brakes.

Historically, the City's demand for housing has been great. Due to the lack of alternative locations, most new residential projects are being developed near major roadways. These environments are noisy, but they comply with Title 24 (State Noise Insulation Requirements) and State Noise Guidelines for Land Use Planning.

FUTURE TRAFFIC NOISE CONDITIONS

Based on roadway traffic projections, noise levels throughout Sunnyvale are not predicted to change significantly due to increases in roadway traffic. A 3dB Ldn change in noise level is considered "significant" because it is considered the amount of increase were the change in noise level is just a noticeable difference. Most homes will continue to have acceptable noise levels in the future. New residential uses will conform to upper limits of the noise guidelines. Nonresidential uses will generally be unaffected by current and future traffic noise.



Several significant roadway projects are under consideration which could affect noise. Available information (as of May 1996) about the noise impacts of these projects is as follows:


- The interchange of Highway 101 and Lawrence Expressway will be reconstructed. Sound walls will be installed, where appropriate, to mitigate traffic noise.
- The possible addition of two lanes on Central Expressway would increase noise levels by less than 3dB Ldn. This project is considered a long range improvement and is currently unfunded.
- The effects of the possible Mary Avenue extension would be insignificant close to its alignment with Highways 101 and 237. This insignificance is due to high ambient noise levels near these highways. However, the extension would generate more traffic and noise (3 to 4dB) on Mary Avenue. This noticeable increase will expose some homes to upper limits of acceptable noise. This project is considered a long range improvement and is currently unfunded.

Because of uncertainties about traffic volumes, speeds and truck percentages of these projects, the potential noise impacts from these projects will need to be evaluated in detail.

MOFFETT FEDERAL AIRFIELD - EXISTING CONDITIONS⁴

In 1994, the Navy ceased its operations at Moffett Naval Air Station. The facility became one of three federal airfields in the United States. Moffett Federal Airfield (MFA) is now operated by the National Aeronautics and Space Administration (NASA).

⁴ Based on a letter to Sunnyvale residents "Moffett Federal Airfield Fact Sheet" dated February, 1996.



In 1995, approximately 24,000 annual aircraft flight operations (a take-off and a landing are each considered to be one flight operation) occurred at MFA. Other noise sources at MFA include wind tunnel facilities and the Outdoor Aerodynamic Research Facility (OARF).

Regulating Noise at Moffett Federal Airfield

There are no federal regulations that apply to aircraft noise at Moffett Federal Airfield.

Since MFA is a federal facility, it is not subject to State or local aircraft noise control regulations. There are no federal regulations that apply to aircraft noise at Moffett Federal Airfield. Whenever possible, NASA considers, on an advisory basis, the Noise Elements of the General Plans of the Cities of Sunnyvale, Mountain View and Santa Clara County as a measure of significance when evaluating the environmental impacts of a proposed project.

In addition, the following plans and regulations (advisory only) guide the operation of MFA under NASA's stewardship:

- Federal Aviation Regulations (FAR) Part 150 - Airport Noise Compatibility and Land Use Planning. Because NASA operates MFA, the airfield is not considered a military facility. When NASA became the steward of MFA in 1994, the agency made a management commitment to use FAA regulations for civil airports as a guide. For a discussion of FAR Part 150, see section titled "*Regulating Noise - Federal Authority*", in this Sub-Element.
- Comprehensive Use Plan (CUP). A Comprehensive Use Plan (CUP) was developed in 1994 by NASA in order to effectively implement the transfer of stewardship of MFA to NASA. The CUP considers future development projects and provides information on the proposed future uses at MFA by NASA and other tenants of MFA up to the year 2010. Future development and operations of MFA are to remain consistent with the CUP. The 2010 forecast conditions in the CUP

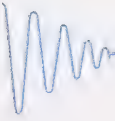
for the airfield are 80,000 annual flight operations, including 60,000 aircraft operations and 20,000 overflights. The CUP 2010 forecast is the same, with regard to number of flight operations and overflights, as the peak use of Moffett in 1990 by the Navy.

For the purpose of establishing baseline conditions against which to compare project impacts, NASA has not used the recent lower activity levels since flight operations could return to the historically higher levels at any time without further environmental review. A projected activity level of 80,000 annual flight operations, as defined by the 1994 CUP, is used as a baseline to compare project impacts.

- Airfield Operations Manual. The Airfield Operations Manual provides general instruction pertaining to the operation of aircraft at MFA, including navigation, air traffic control, noise abatement, and arrival and departure instructions. All aircraft using MFA must adhere to the rules, procedures and guidelines in this document.
- California Division of Aeronautics, Noise Guidelines. In 1970 these regulations established the noise descriptor method, Community Noise Equivalent Level (CNEL). The regulations require airports to operate without incompatible land uses inside the 65 dB CNEL contour unless the airport requests a Variance from the California Division Aeronautics.
- California State Noise Guidelines for Land Use Planning. For a discussion of these guidelines, see section titled "Regulating Noise - State Authority", of this Sub-Element.
- U.S. Air Force Family Housing Guide. This guide applies only to family housing located on Air Force bases.



The 2010 forecast is the same as peak year 1990 by the Navy, with regard to number of flight operations and overflights

- 
-
- Housing and Urban Development (HUD) Noise Criteria. This requires that federally funded residential development must meet established noise criteria.

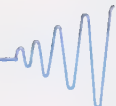
If Moffett Federal Airfield were to convert to a commercial or general aviation airfield at some point in the future, different regulations would apply.

THE FUTURE OF MOFFETT FEDERAL AIRFIELD

The future use of Moffett Federal Airfield will have a significant effect on the noise environment in Sunnyvale. Potential future noise impacts of Moffett Federal Airfield (MFA) are shown in Appendix B, "*Mitigated Year 2010 Forecast Noise Exposure Conditions (CNEL)*". According to NASA, to sustain Moffett as a federal airfield, additional federal revenues must be found to eliminate or reduce Moffett's annual operating revenue shortfall. No other federal agency appears likely to take over NASA's role as the operator of Moffett Federal Airfield. In 1996, the only users NASA can consider to supplement revenues must be federal or federally sponsored airfield users. In late 1996, NASA was reviewing alternatives to determine what federal programs can be identified to provide additional revenues to Moffett Federal Airfield.

General Aviation at Moffett Federal Airfield

The transfer of Moffett Field to NASA's jurisdiction does not include a "re-use" option for general aviation. NASA has stated that there will be no space available for any general aviation or other non-federal entities at Moffett Field. In addition, NASA has stated that civil aviation is not compatible with federal operations at Moffett Field (1992 letters from NASA Ames Director, Dale Compton to City of Sunnyvale Mayor Castillo and the City Council, and City of San Jose Mayor, Susan Hammer). Despite NASA's stated policy, the City of San Jose, the Santa Clara County Transit District and several aviation organizations have urged that the Moffett facilities be made available to general aviation aircraft. Because of the uncertainties in air traffic volumes,



air space considerations, and type of aircraft, it is difficult to predict the noise impacts associated with general aviation at MFA.

Commercial Operations and the Future of Moffett Federal Airfield

Moffett's status as a federal airfield does not allow for commercial operations. If NASA were to leave Moffett and dispose of the facility, the current federal property disposal process could result in a change of status to a commercial airport. A commercial airport at Moffett may have a capacity of up to 800 daily flight operations (300,000) annually, depending on the mix of aircraft used⁵. However, airspace considerations, which are not known at this time, would probably impose some limitations on this capacity.⁵

The City of Sunnyvale does not have authority to determine what NASA will ultimately decide to do with the future use of Moffett Federal Airfield. NASA has the authority to make final decisions on Moffett's operations. Any policies adopted by the City are advisory in nature and are not binding in the federal decision making process. However, NASA has been responsive to the community concerns raised by the Cities of Sunnyvale and Mountain View. The City of Sunnyvale should continue to monitor developments at MFA and communicate community concerns, including potential noise impacts, to NASA.

By 2010, residents of Sunnyvale may hear twice as many aircraft as they did in 1995.

SAN JOSE INTERNATIONAL AIRPORT

In 1994, San Jose International Airport had 295,000 flight operations. Residents in northeast Sunnyvale are affected by San Jose Airport flight patterns. By 2010, they may hear twice as many aircraft as they did in 1995. However, noise levels will eventually stabilize and decrease as quieter aircraft become prevalent. Current and future noise levels are below state limits. The City of Sunnyvale is one of the legislative bodies that appoints the members of the Santa Clara County Airport Land Use Commission (ALUC). For a

⁵ Ibid.



discussion of the purpose of the ALUC see section on this Sub-Element titled *"Regulating Noise, County Authority"*.

Two flight patterns affect northeast Sunnyvale. When winds are from the south, aircraft approach San Jose International Airport from the northwest (over Sunnyvale). When aircraft bank to the right during takeoffs, back blasts occur in Sunnyvale's direction. These turning movements cause a longer period of increased noise than do simple overflights.

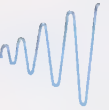
The State Aeronautic Act requires civilian airports to eventually achieve a CNEL of 65dB for residential areas. A noise contour map for San Jose International Airport shows that Sunnyvale's CNEL is less than 65dB. Northeast Sunnyvale is probably in the range of 55 to 60dB CNEL, but precise contours have not been published.

The frequency of flights is increasing. The number of passengers rose from 3.8 million in 1984 to 6.8 million in 1995. By 2010, 12.5 to 16.1 million passengers are expected to use San Jose International Airport. This activity will result from terminal expansion plans, the international status of the airport, and the growing importance of the local air travel market.

Despite more activity in the future, noise levels throughout the airport's corridor are expected to stabilize in the long term, and go down in the longer term. This reduction will mainly be due to the use of quieter aircraft. Such use rose from 38 percent in 1964 to 47 percent in 1985. In the year ending in August 1996, 92% of the scheduled flight operation at San Jose International Airport were Stage 3 aircraft. A federal mandate requires that Stage 2 aircraft (noisier aircraft than Stage 3) be phased out by the year 2000.

What do these trends mean to northeast Sunnyvale? Little can be done to change the air patterns and the increased frequency of flights. Residents can expect to hear more aircraft, but not more noise from a single event. They can also expect average noise levels to level off and decrease over time. According to State guidelines, their noise environment will remain acceptable.

Despite more flight activity in the future, noise levels throughout the San Jose International Airport's corridor are expected to stabilize in the long term, and go down in the longer term.



HELICOPTERS

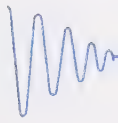
Heliport Standards

There are no heliports located in Sunnyvale. Santa Clara County has only six heliports. One is open to the public at San Jose International Airport. The others are restricted to private use by companies, hospital/medical uses, executives and other individuals.

There is no formally adopted heliport plan for Santa Clara County. The Airport Land Use Commission (ALUC) has developed noise standards for heliports affecting residential uses. The noise standards:

- prohibit residential structures within the 65 dB CNEL noise impact boundary of the heliport;
- require a 45 dB interior annual CNEL for residential structures with the windows closed;
- require acoustical analysis showing that any new residential structure within the 60 dB CNEL contour be designed to limit intruding noise to prescribed allowable levels; and
- limit the maximum noise level at the nearest residentially zoned area to not exceed 80 dBA by reason of the heliport.

Design and location criteria for any new private use heliports would require permits from the ALUC and affected cities.



Helicopters at Moffett Federal Airfield

There were approximately 6,000 helicopter flight operations at Moffett Federal Airfield in 1995 which accounted for 1/4 of the total flight operations (24,000) at MFA in 1995. The helicopters are used for training purposes and generally have several "touch and go" operations in one training session. Each take-off and landing is considered a flight operation. There are two touch and go patterns that the helicopters use: an east and a west pattern. The east pattern crosses over Sunnyvale, the west pattern crosses over Mountain View. The eastern pattern in Sunnyvale crosses mainly over industrial land uses but also crosses over some residential land uses.

Helicopters at Construction Sites

Helicopters are sometimes used in construction projects to lift heavy equipment. In most cases, the work occurs away from residential areas. Occasional conflicts arise when the work occurs near homes. The City does not regulate activities of helicopters used at construction sites. The Federal Aviation Administration (FAA) evaluates airspace considerations associated with the temporary landings (heliports) of the helicopters used at construction sites. The Caltrans Division of Aeronautics exempts temporary heliports at construction sites from obtaining a heliport permit as long as the event is less than one year in length and permission of the property owner has been obtained.

OVERFLIGHTS

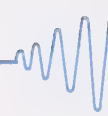
Sunnyvale lies under the path of many aircraft flying at high altitudes. These overflights are rarely a problem.

CURRENT TRAIN NOISE

Central Sunnyvale is affected by noise from the CALTRAIN corridor. Since 1992, SamTrans has managed commuter train operation under the direction of the Peninsula Joint Powers Board (JPB). JPB member agencies include the



Overflights of aircraft are rarely a problem.



Santa Clara County Transportation Authority, the San Mateo Transit District, and the City and County of San Francisco. Commuter trains carry about 17,500 people per day. In 1996, there are 59 (29 northbound and 30 southbound) commuter trains daily between San Francisco and San Jose. Eight commuter trains run through Sunnyvale between the hours of 8:00 p.m. and 6:00 a.m.

There are also freight train operations at night. Unscheduled freight operations can happen any time. In addition to noise from train passbys, train horns blow at the Mary Avenue and Sunnyvale Avenue at-grade rail crossings and two local stations.

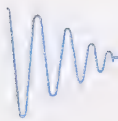
Currently, the areas affected by train noise have an Ldn of 71-73 dBA at 50 feet from the tracks (see Noise Condition Map). Maximum noise events can reach 90 dBA (engines) and 105 dBA (horns). Current noise levels are acceptable for all but approximately 80 older homes near the tracks which experience "conditionally acceptable" noise levels. Some of these homes are exposed to excessive outdoor noise (above 70dB Ldn) and probably excessive interior noise as well (above 45dB Ldn). Title 24 (State Noise Insulation Requirements), discussed in the *"Regulating Noise, State Authority"* section of this Sub-Element, can protect new multi-family residential uses from excessive train noise. Current noise levels are generally acceptable for non-residential uses.



Central Sunnyvale is affected by noise from the CALTRAIN corridor.

FUTURE TRAIN NOISE

Commuter train operations are likely to continue and expand. In 1992, when the JPB assumed operation of the line, the number of trains was increased and long range plans have been made to further increase service. JPB is also considering moving the downtown San Francisco station to a more central location. If this happens, the number of commuter trains could double. Ldn contours would increase by a noticeable 3dB. The JPB is also considering electrification of the route; this could reduce the existing Ldn by as much as 8 dB. Because of uncertainty in



these plans, these conditions are not noted on the Noise Condition Map.

Freight train operations are not likely to expand. There are few major rail shippers left on the railroad line. Commuter passenger service is now the primary reason for the existence of the railroad line. Heavy industry on the Peninsula and in San Francisco is in decline.

Sunnyvale has no jurisdiction over the number or noise level of trains. If the frequency of trains increases in the future, conditions could worsen for abutting homes. The City can monitor changes in the number and noise levels of trains, and seek mitigation for any change that would worsen local conditions. Using the discretionary land use permit process and the California Environmental Quality Act (CEQA), the City can require mitigation or avoid new residential developments adversely affected by train noise. This position must be balanced against the benefits of train use by commuters. The City could also educate owners of older homes on ways to reduce noise levels from trains. The City could support noise legislation for trains. Normal construction techniques will achieve acceptable working environments for commercial, office and industrial buildings.

LIGHT RAIL NOISE



The light rail transit line project will incorporate mitigation techniques to ensure that there are no excessive noise impacts for residents.

In 1996 construction began on a light rail transit line through northern Sunnyvale. There will be six stations in Sunnyvale. This line will traverse Tasman Drive, Java Drive, Mathilda Avenue and Moffett Park Drive. The area is predominantly industrial, with the exception of Tasman Drive, where there are several large mobile home parks. The frontage on Fair Oaks Avenue is Futures Sites 7 and 8 (residential). Noise and vibration studies done as part of an Environmental Impact Report/Statement for the project indicated that barriers should be provided to guard against wheel squeal at two locations near the mobile home parks. The project will provide these barriers, as well as replacing dilapidated wooden fences with concrete community walls. These mitigation techniques will result in no excessive noise impacts for residents in these areas.

NOISE ENVIRONMENTS FOR OUTDOOR RECREATIONAL AREAS OF RESIDENTIAL USES

How much noise is acceptable for outdoor recreation areas of residential uses? The State Noise Guidelines indicate that residential land uses with 60-75dB outside Ldn are "conditionally acceptable". The City has enforced this limit in plans and projects and attempts to achieve a 60 dB Ldn for backyards and common recreation areas. The City has approved projects with conditions of approval that require achieving an Ldn of 60dB for common recreation areas, back yards, patios, and large and medium balconies but not for small balconies. Common recreation areas, patios and backyards have a high use rate and deserve a fairly quiet setting. A quiet environment does not seem to be as important for small balconies. Small balconies have a low use rate and sometimes face a major roadway. Because small balconies are frequently above ground level, options for reducing the noise (beyond site plan considerations) are limited to enclosing the balconies with a glass shield. Enjoyment of these areas is reduced by the high glass shields, therefore the City has not required achieving an Ldn of 60 dBA for small balconies.



Common recreation areas, patios and backyards have a high use rate and deserve a fairly quiet setting.

Achieving an outdoor Ldn of 60 dBA if the noise source is a railroad, is generally less important. This is because train noise is usually made up of relatively few loud events. Although the outdoor Ldn may be high, the noise level between events is typically acceptable for speech. An Ldn limit of 60dB would be unnecessary. An Ldn limit of 70 dBA is more appropriate for areas affected by train noise.

If the noise source is aircraft, an outdoor Ldn limit of 60dB would be impractical. Aircraft noise comes from overhead, not from ground level. This source makes it difficult to shield aircraft noise from people who are outdoors. Preventing residential uses within areas of high Ldn from aircraft is a way of avoiding noise exposure of homes from aircraft.



Community Noise

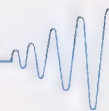
The noise provisions in the Sunnyvale Municipal Code regulate operational noises and some single-event noises.

For the purposes of this Noise Sub-Element, community noise is everything other than transportation noise. There are two types of community noise: land use operational and single-event noise. The noise provisions in the Sunnyvale Municipal Code (effective February, 1995) regulate operational noises and some single-event noises. (See the section titled "*Regulating Noise, Sunnyvale Authority*" in this Sub-Element for a detailed discussion of content of noise regulations in the Sunnyvale Municipal Code.) The noise regulations were revised to address complaints and concerns regarding the hours of operation and noise levels produced by certain activities and powered equipment which affected some residents.

The rationale behind the content of the noise regulations is to:

- address the majority of complaints received about noise;
- provide adequate and appropriate protection to the residential community while providing sufficient opportunities for businesses to operate; and
- keep the ordinance simple and easy to understand and enforce.

Because the Municipal Code noise provisions address the majority of noise complaints, noise complaints from people in special circumstances (e.g. unusual schedules or sensitivities to certain noises) are not accommodated. For example, a night shift worker trying to sleep during the day would be expected to tolerate children playing nearby. City staff and community members acknowledge that the Municipal Code is not a panacea for all noise issues. In some instances, complaints about noise are difficult to resolve despite the intent and guidelines of the noise regulations.



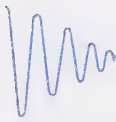
NOISE COMPLAINTS

In October of 1995, the effectiveness of the revised provisions was evaluated (RTC No. 95-402 "Noise Ordinance Review"). A portion of the review consisted of tabulating noise complaints by noise source during the period February 1, to August 31, 1995. The majority of noise complaints (42%) received were about noisy neighbors, music and parties. The second largest number (22%) of noise complaints were related to noise produced by powered equipment (leaf blowers, lawn mowers and edgers). Table 3, summarizes the number and types of noise complaints received by the City during the review period.

Table 3 - Types of Noise Complaints Received 2/1/95 - 8/31/95

Type of Complaint	Number	Percentage
Noisy Neighbors, Music, Speech, Impulsive Sound	138	42
Powered Equipment	74	22
Other (barking dogs, children, airplane, car horns, etc.)	42	12
Security Alarms	30	9
Construction Noise	25	7
Land Use Operational Noise	22	6
Deliveries	10	2
Total	341	100

The noise complaints that cannot be resolved through application of code regulations are primarily due to conditions existing prior to adoption of the revisions (February, 1995), conditions that are not appropriate to regulate (children at child care centers) or conditions that are beyond the City's sphere of influence (transportation noise). The result of the October 1995 review was that the noise regulations, in concert with other sections of the Sunnyvale Municipal Code, addresses most community noise issues. Effectiveness of the Sunnyvale Municipal Code noise



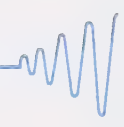
regulations should be periodically monitored. The number and type of noise complaints can be monitored on an annual basis (as part of the Community Condition Indicators - see Table 5).

ENFORCEMENT

Noise complaints are received and handled by the Public Safety Department and the Community Development Department's Neighborhood Preservation and Building Safety Divisions. The type of noise and when it occurs determines which department initially responds. Table 4, of this Sub-Element, shows the procedures and responding department for noise complaints received by the City.

Table 4 - Noise Complaint Response Procedure

Noise Complaints (Time and Type)	Responding Department or Division
All Types of Noises (nighttime hours)	Public SAFETY - certain types of noise complaints (see below) are subsequently referred to the Neighborhood Preservation or Building Safety Divisions for resolution.
Powered equipment, operational noise and deliveries (nighttime hours)	Reported to the Department of Public Safety but are subsequently resolved through Neighborhood Preservation Division
Powered equipment, operational noise and deliveries (daytime hours)	Neighborhood Preservation Division
Barking dogs (all hours)	Public Safety
Family disturbance and domestic violence (all hours)	Public Safety
Other nuisance noise (all hours)	Public Safety
Construction noise (nighttime hours)	Reported to the Department of Public Safety but are subsequently resolved through Building Safety Division
Construction noise (daytime hours)	Building Safety Division
Extreme and recurring noise	Cases are cited as a violation of the Code by the Department of Public Safety and may be referred to the Office of the City Attorney



Each noise complaint represents a specific set of circumstances, but in all cases staff tries to find a solution to resolve the problem. Only about 5% of the noise complaints are addressed using Title 19 (zoning) noise regulations.

In the case of noise complaints resulting from operational noise, it may be necessary to take one or several instantaneous decibel (dBA) readings to determine if the noise generated is in compliance with the operational noise regulations in the Sunnyvale Municipal Code. The readings taken to measure the noise level should be taken at the property line of the property generating the noise and in a location and time that fairly represents the noise.

Most complaints are resolved through mediation at the time of the incident and by giving citizens information regarding noise issues and noise regulations. In accordance with Council's direction, all staff involved in code compliance emphasize problem solving techniques rather than a punitive approach. To date this approach seems to meet the needs of the City and the community. In the majority of cases compliance is achieved.

NOISE COMPLAINTS - MOFFETT FEDERAL AIRFIELD (MFA)

Complaints that NASA receives about aircraft operations at MFA are intermittent but average about 5 per month (once a week). Most of the "complaints" are inquiries about what type of aircraft is flying or why aircraft are flying at nighttime.



Most of the "complaints" that NASA receives about aircraft are inquiries about what type of aircraft is flying.

Noise Reduction Techniques

Up to this point, this Sub-Element has focused on ways to reduce the source of noise. This section explains how to block the path of noise and insulate people from noise.

SOUND WALLS



Typical sound walls will reduce noise levels about 6 to 8 dBA.

Because all major freeways and Lawrence Expressway are already protected by sound walls, installing walls is no longer an option for the City for noise protection from traffic noise in these areas. However, to comply with Title 24, the City may require additional sound walls to be constructed around new residential developments that are adjacent to major roadways.

Typical sound walls (6 to 8 feet high) will reduce noise levels about 6 to 8 dBA. Sound walls should be close to either the noise source or the noise receiver. Effective walls are solid and impervious to air flow. Sound walls must be continuous, so that noise cannot travel through openings or around the ends. In addition, the material the sound wall is made of (wood, masonry, etc.) affects the amount of sound that travels through the sound wall. The material the sound wall is made of must be dense enough to provide the mass needed to block the sound.

Sound walls are most effective at reducing noise on properties nearest to the sound wall. The effectiveness of the sound wall at reducing noise decreases as the distance from the sound wall increases.

The use of very high sound walls has limited benefits. This conclusion was reached in the Southern Pacific Corridor Specific Plan. The Plan concluded that the location of residential units, site plan arrangements and building insulation are more effective ways to protect people from noise.

Sound walls can be unattractive, isolate neighborhoods and give the community a "walled-in" appearance. This effect



can be minimized by landscaping and earth berms, and by requiring walls that are more decorative than the standard choices.

Proposed sound walls or other barriers should be reviewed for design, location, and material before installing the sound wall. Sound readings should be taken before and after installing the sound wall (or other noise reduction barrier) in order to determine the efficacy of the noise reduction barrier. The measurement techniques should be similar to procedures used by Caltrans to measure efficiency of sound walls.

SETBACKS

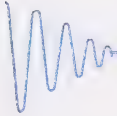
Building setbacks can reduce noise if the distance is substantial. Sound levels decrease 3 to 5dB for each doubling of the distance from the center of the road. For example, a building located 50 feet from the center of the road may have an Ldn of 64 dBA at the building facade closest to the roadway. But if the building were setback to 100 feet from the center of the roadway (an additional 50 feet), the Ldn would be reduced to about 60 dBA.

SITE PLANNING

Site planning is a good way to block noise. The concept is to buffer sensitive areas (such as bedrooms) with less sensitive areas (such as a parking structure).

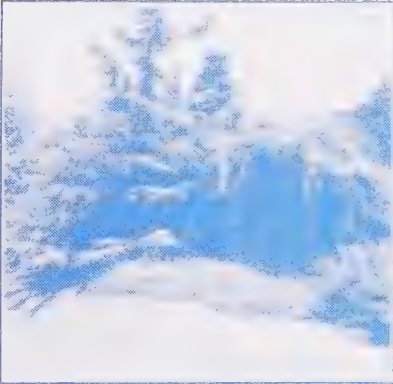
Floor plans can be arranged to orient sensitive bedroom and living room areas away from the noise source. Garages, kitchens and bathrooms can be noise buffers.

Conventional home building practices will reduce interior noise levels by about 15dB, even with windows partially open. If these practices are not enough to achieve acceptable noise levels, other measures such as air conditioners which allow windows to remain closed, double or triple pane windows, airtight doors and windows, and vents oriented away from the noise, may be needed. These,



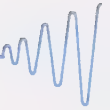
and other measures are required by Title 24 when the indoor Ldn exceeds 45dB. See section in this Sub-Element titled *"Regulating Noise, State Authority"*, for a discussion of Title 24, Noise Insulation Requirements.

LANDSCAPING



Planting of landscaping can have an aesthetic and psychological value by removing the noise source from view.

Landscaping provides little reduction in noise levels. 100 feet of dense foliage (so that no visual path extends through the foliage) achieves approximately 3-5 dBA noise reduction. Planting of landscaping can have an aesthetic and psychological value by removing the noise source from view, but actual noise levels will be reduced only slightly by the plantings.



The Strategic Plan

Because the noise environment of the City is a vital component to the quality of life in Sunnyvale, it is important to develop a strategic plan for responding to the existing and changing noise environment in Sunnyvale. Transportation noise causes most of the ambient noise in Sunnyvale. The City has little control over transportation-related noise sources. The City can mitigate new residential development in areas where homes would be exposed to "conditionally acceptable" transportation noise. The City can avoid new residential development in areas where homes would be exposed to "unacceptable" transportation noise. However, the City must balance the need for housing and improving transportation systems with maintaining and creating an acceptable noise environment in the community. Using the policies and action statements contained in this Sub-Element provides the City with thresholds of significance to determine when to avoid and mitigate noise.

The City must balance the need for housing and improving transportation systems with maintaining and creating an acceptable noise environment in the community.

Some single-event noises can be more irritating than ambient noise. The City's current approach of mediating complaints about most single-event noise has been effective. The regulations for single-event noise (powered equipment and deliveries) have limited some single-event noise to daytime hours. While this may not address all individual complaints about single-event noise, it does provide protection to the residential community while providing opportunities for businesses to operate in the community. It is in the City's interest to keep the noise ordinance simple and easy to understand and enforce.

Community condition indicators, which show transportation and community noise-related data (see Table 5) will be monitored annually to insure goals are being met.



Community Condition Indicators

Traffic Noise

- average daily traffic (ADT) counts on selected roads

Railroad Noise

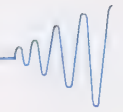
- number of commuter trains per day

Aircraft Noise

- Moffett Federal Airfield flight operations per year
- San Jose International Airport flight operations per year

Community Noise

- complaints per year from land use operation and single-event noise



Updating the Noise Sub-Element

Periodic updating can provide current data on community conditions and indicate if goals are being met.

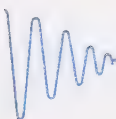
ANNUAL UPDATE

- Update community condition indicators in Table 5.
- Assess any changes in state and federal noise standards and/or guidelines.

FIVE YEAR UPDATE

Five-year reviews are recommended by State law to include:

- Assess changes in transportation conditions (roadways, aircraft, trains, light rail and rapid transit facilities).
- Update the Noise Condition Map and its accompanying technical report.
- Assess the effectiveness of regulations for operational noise and single-event noise.
- Research the latest information on noise measurement and noise reduction techniques.
- Assess all goals, policies and action statements.

**Table 5 - Community Condition Indicators**

Noise Source	Year 1986	Year 1996
U.S Highway 101	130,000 ADT *	175,000 ADT
State Highway 237	40,000 ADT	53,000 ADT
Lawrence Expressway (between Highways 101 and 237)	40,000 ADT	40,000 ADT
Evelyn Avenue (between Mathilda and Sunnyvale Avenues)	12,916 ADT	13,615 ADT
Fremont Avenue (between Mary and Hollenbeck Avenues)	22,730 ADT	20,706 ADT
Homestead Road (between Hollenbeck Avenue and S'vale-Saratoga Road)	30,970 ADT	22,605 ADT
Hollenbeck Avenue (between Homestead Road and Fremont Avenue)	15,230 ADT	15,037 ADT
Mary Avenue (between Central Expressway and Maude Avenue)	12,000 ADT	14,718 ADT
Remington Drive (between El Camino Real and Sunnyvale-Saratoga Rd.)	16,160 ADT	14,778 ADT
Wolfe Road (between Homestead Road and Fremont Avenue)	30,550 ADT	29,912 ADT
Commuter Trains (trains per day)	52	59
Moffett Federal Airfield (flight operations per year)	80,000	24,000
San Jose International Airport (flight operations per year)	General Aviation: Commercial: 247,892 103307	157,685 130,621
Land Use Operational Noise Complaints	Not Available	22 ¹ (7 months)
Single-event Noise Complaints (includes powered equipment, deliveries, music, voices, alarms, barking dogs, airplane, fireworks, horns etc.)	Not Available	294 ¹ (7 months)

* Average Daily Trips

- 1 Report to Council, No. 95-402, "Noise Ordinance Review", completed in October of 1995. Part of the report involved tabulating the number and types of noise complaints received by the City during the 7 month period from February 1 to August 31, 1995.



GOALS, POLICIES & ACTION STATEMENTS

GOALS, POLICIES AND ACTION STATEMENTS

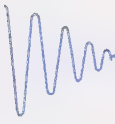
Introduction

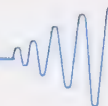
This section of the Noise Sub-Element contains a set of integrated goals, policies and action statements. The goals and policies reflect the current and future direction of the City regarding noise. They will guide decision makers confronted with specific issues and proposals. The action statements outline specific ways to implement the City's goals and policies.

The goals and policies regarding noise will guide decision makers confronted with specific issues and proposals.

Goals, policies and action statements of this Sub-Element are based on certain assumptions. They are:

- Noise is a significant part of Sunnyvale's environment.
- Sunnyvale residents need and desire a living environment reasonably protected from noise.
- The City has capabilities as a single entity to improve some noise conditions, protect others from getting worse, and protect acceptable conditions.
- The City can encourage other public agencies to address noise issues as part of their plans and projects.

- 
-
- Protection from excessive noise must be balanced with other community and regional goals.
 - Continued exposure to excessive noise is inevitable in parts of the City, as is the worsening of some noise levels.



Goals, Policies and Action Statements of the Noise Sub-Element

Noise Sub-Element goals are organized under three headings:

- Goal 3.6A - Land Use Compatibility
- Goal 3.6B - Transportation Noise
- Goal 3.6C - Community Noise

GOAL 3.6A

MAINTAIN OR ACHIEVE A COMPATIBLE NOISE ENVIRONMENT FOR ALL LAND USES IN THE COMMUNITY (LAND USE COMPATIBILITY).

Policy 3.6A.1

Prevent significant noise impacts from new development by applying state noise guidelines and Sunnyvale Municipal Code noise regulations in the evaluation of land use issues and proposals.

Action Statements

3.6A.1a Apply the Sunnyvale Municipal Code noise regulations in the evaluation of land uses and proposals. Acoustical analysis may be required to determine if mitigation measures shall be required for the new development. If required, mitigation measures shall be incorporated into the new development that bring the proposed development into conformance with the noise regulations in the Sunnyvale Municipal Code.

3.6A.1b Consult the Noise Condition Map (Appendix A) to determine noise levels throughout the City.

3.6A.1c Comply with the "Noise and Land Use Compatibility Guidelines" (Table 2) for the compatibility of land uses with their noise environments, except where the City determines that there are prevailing circumstances of a unique or special nature.

3.6A.1d Use Table 3.6A.1d to determine if proposed development results in a "significant noise impact" on existing development.

Table 3.6A.1d - Significant Noise Impacts from New Development on Existing Land Uses

Ldn Of Existing Development ¹	Significant Noise Impact Increase In Ldn Of Existing Development From New Development
"Normally Acceptable" ²	more than 5 dBA, but noise level still in the "Normally Acceptable" category
"Normally Acceptable"	more than 3 dBA and the noise level exceeds the "Normally Acceptable" category
exceeds "Normally Acceptable"	more than 3 dBA

¹ The Ldn shall be measured at any point along the property line shared by the proposed development and existing land uses.

² "Normally Acceptable" as defined by the State of California "Noise and Land Use Compatibility Guidelines", summarized in this Sub-Element.

3.6A.1e Use the CEQA and the discretionary permit processes to protect existing land uses from significant noise impacts due to new development. Acoustical analysis required as part of the CEQA or discretionary permit process, master plans, and/or design review shall determine if significant noise impacts occur from proposed development on existing land uses. If significant noise impacts occur, then mitigation measures shall be required to minimize the impact of the new development on existing land uses.

3.6A.1f Supplement the "Noise and Land Use Compatibility Guidelines" (Table 2) for residential uses by attempting to achieve an outdoor Ldn of no greater than 60 dBA for common recreation areas, backyards, patios, and medium and large-size balconies. These guidelines should not apply where the noise source is a railroad or airport. If the noise source is a railroad, then an Ldn of no greater than 70 dBA should be achieved in common

recreation areas, backyards, patios, and medium and large balconies. If the noise source is from aircraft, then preventing new residential uses within areas of high Ldn from aircraft noise is recommended.

Policy 3.6A.2

Enforce and supplement state laws regarding interior noise levels of residential units.

Action Statements

3.6A.2a Enforce Title 24 Noise Insulation Requirements for all new hotels, motels, apartments, condominiums group care homes, and all other dwellings, except single-family detached homes.

3.6A.2b Apply Title 24 Noise Insulation Requirements to all new single-family detached homes.

3.6A.2c Attempt to achieve a maximum instantaneous noise level of 50dBA in bedrooms and 55dBA in other areas of residential units exposed to train or aircraft noise, where the exterior Ldn exceeds 55dB .

Policy 3.6A.3

Consider techniques which block the path of noise and insulate people from noise.

Action Statements

3.6A.3a Use a combination of barriers, setbacks, site planning and building design techniques to reduce noise impacts, keeping in mind their benefits and shortcomings.

3.6A.3b Consider compiling and distributing information to residents of noise-impacted areas about what they can do to protect themselves from noise.

3.6A.3c Proposed sound walls or other noise reduction barriers should be reviewed for design, location, and material before installing the barrier. Sound readings should be taken before and after installing the noise



Consider techniques which block the path of noise and insulate people from noise.

reduction barrier in order to determine the efficacy of the noise reduction barrier. Measurement techniques shall be similar to procedures used by Caltrans to measure efficiency of sound walls.

GOAL 3.6B

PRESERVE AND ENHANCE THE QUALITY OF NEIGHBORHOODS BY MAINTAINING OR REDUCING THE LEVELS OF NOISE GENERATED BY TRANSPORTATION FACILITIES (TRANSPORTATION NOISE).

Policy 3.6B.1

Refrain from increasing or reduce the noise impacts of major roadways.

Action Statements

3.6B.1a Identify and mitigate roadway noise impacts as part of local land use plans and proposals.

3.6B.1b Regulate the location, design and capacity of local roadway improvement projects to mitigate their noise impacts.

3.6B.1c Use local traffic management techniques to reduce or protect noise levels. (For example, the City can place truck routes away from neighborhoods. Commuters can be diverted from residential streets. Note that some techniques may address one problem but cause others. For instance, stop signs can improve safety but they can also raise noise levels. In such cases, the City must balance its goals to the extent possible.)

3.6B.1d Advocate that neighboring cities should identify and mitigate roadway noise impacts that affect Sunnyvale as part of their land use plans.

3.6B.1e Advocate that public agencies should identify and mitigate noise impacts as part of their transportation system improvement projects.



Refrain from increasing or reduce the noise impacts of major roadways.



3.6B.1f Support state legislation to reduce vehicle noise levels.

3.6B.1g Continue to enforce state muffler and exhaust laws.

Policy 3.6B.2

Support efforts to reduce or mitigate airport noise.

Action Statements

3.6B.2a Support the retention of the Airport Land Use Commission.

3.6B.2b Support the right of private citizens to sue airports for noise impacts.

3.6B.2c Encourage airport operation policies and procedures which reduce the level and frequency of noise as well as other policies and federal funding to alleviate the effects of aircraft noise.

Policy 3.6B.3

Support activities that will minimize the noise impacts of Moffett Federal Airfield.

Action Statements

3.6B.3a Monitor the annual number of flight operations and evaluate any increases in activity.

3.6B.3b Encourage NASA to seek ways to minimize flights over the community and manage practice landings.

3.6B.3c Encourage NASA to continue to direct flight operations over the Bay during evening and nighttime hours.

3.6B.3d Encourage NASA to continue flight, landing and maintenance procedures which lower noise levels.

3.6B.3e Encourage NASA to establish a complaint record and response program.

3.6B.3f Support the continuation of NASA's public information program.

3.6B.3g Oppose any effort and/or expenditure of public funds to promote Moffett Federal Airfield for non-federal purposes.

3.6B.3h Support efforts to limit non-essential air traffic at Moffett Federal Airfield.

3.6B.3i Support federal legislation that require military and federal aircraft to meet Stage 3 noise requirements similar to commercial aircraft.

Policy 3.6B.4

Support activities that will minimize and/or reduce the noise impacts of San Jose International Airport.

Action Statements

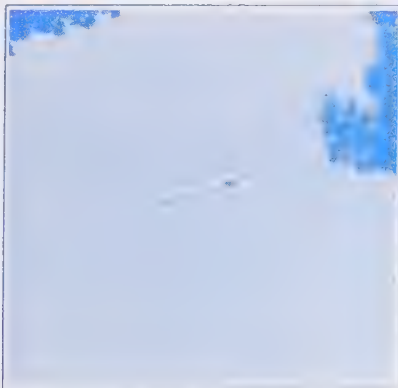
3.6B.4a Monitor the annual number of passengers and evaluate trends in activity at San Jose International Airport.

3.6B.4b Monitor plans for expansion of San Jose International Airport terminals and evaluate the resulting increases in activity.

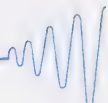
3.6B.4c Consider encouraging the City of San Jose to install a local noise monitoring station in the Lakewood area.

3.6B.4d Encourage the City of San Jose to promote the use of Stage 3 aircraft.

3.6B.4e Encourage the City of San Jose to maintain strict control over flight patterns which influence noise in Sunnyvale.



Support activities that will minimize and/or reduce the noise impacts of San Jose International Airport.



3.6B.4f Encourage the City of San Jose to educate pilots and seek their cooperation in using cockpit techniques that reduce noise levels.

3.6B.4g Support federal legislation to lower the noise levels of civilian aircraft.

3.6B.4h Support state legislation to lower the noise levels of civilian airports.

Policy 3.6B.5

Encourage activities that limit the noise impacts of helicopters.

Action Statements

3.6B.5a Encourage NASA to direct helicopter flight operations and flight patterns so that they occur over industrial, not residential, areas.

3.6B.5b Allow the use of airborne helicopters at construction sites on a limited basis as permitted by the FAA and the Caltrans Division of Aeronautics.

Policy 3.6B.6

Mitigate and avoid the noise impacts from trains.

Action Statements

3.6B.6a Monitor plans and projects which would increase the number of commuter trains, and evaluate their noise impacts and seek mitigation for any change that worsens local conditions.

3.6B.6b Monitor plans and projects which would increase the number of freight trains, and evaluate their noise impacts and seek mitigation for any change that worsens local conditions.

3.6B.6c Avoid construction of new residential uses where the outdoor Ldn is greater than 70 dBA as a result from train noise.



3.6B.6d Educate owners of older homes on ways to reduce noise levels from trains.

3.6B.6e Support legislation to reduce the noise level of trains.

3.6B.6f Seek the cooperation of train engineers to avoid unnecessary and prolonged use of air horns except for safety purposes.

Policy 3.6B.7

Monitor and mitigate the noise impacts of light rail facilities.

Action Statements

3.6B.7a Monitor regional plans for light rail facilities in Sunnyvale to ensure that noise impacts are identified and mitigated.

GOAL 3.6C

MAINTAIN OR ACHIEVE ACCEPTABLE LIMITS FOR THE LEVELS OF NOISE GENERATED BY LAND USE OPERATIONS AND SINGLE-EVENTS (COMMUNITY NOISE).

Policy 3.6C.1

Regulate land use operation noise.

Action Statements

3.6C.1a Monitor the effectiveness of operational noise regulations every five years by referring to related community condition indicators.

3.6C.1b Apply conditions to discretionary land use permits which limit hours of operation, hours of delivery and other factors which affect noise.

3.6C.1c Continue interdepartmental procedures to respond to complaints about operational noise.

3.6C.1d Instantaneous noise measurements taken for the purpose of enforcing the noise regulations in the Sunnyvale Municipal Code shall be taken at the property line of the property generating the noise and in a location and time(s) that fairly represents the noise.

Policy 3.6C.2

Regulate select single-event noises and periodically monitor the effectiveness of the regulations.

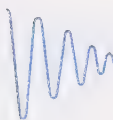
Action Statements

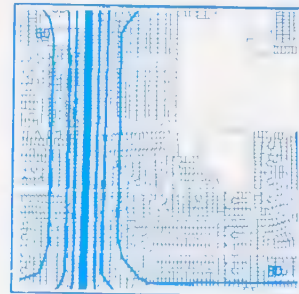
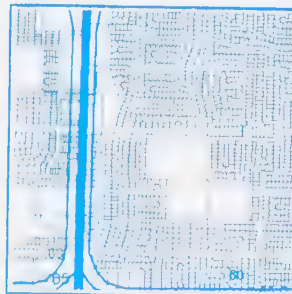
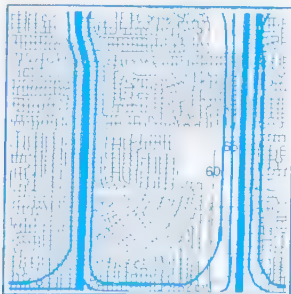
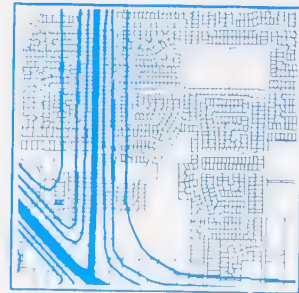
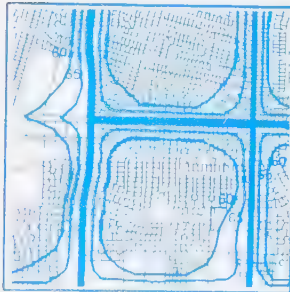
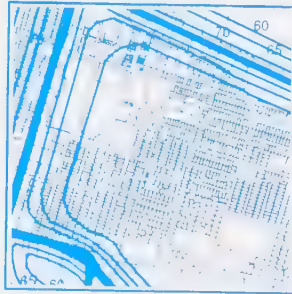
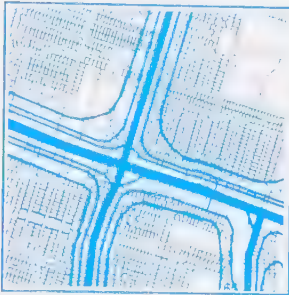
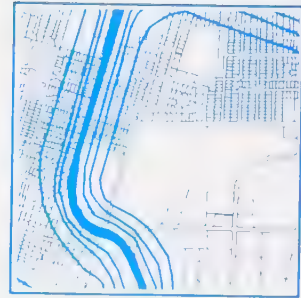
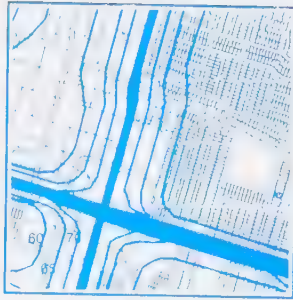
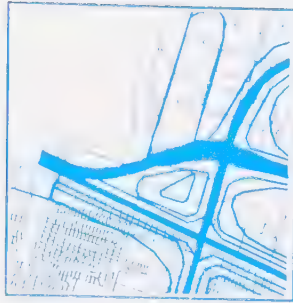
3.6C.2a Monitor the effectiveness of limits on deliveries hours and hours of operation of powered equipment on properties adjacent to residentially zoned properties every five years by referring to related community condition indicators.

3.6C.2b Continue efforts by the Department of Public Safety and Neighborhood Preservation to mediate complaints about single-event noise that is not regulated by the Sunnyvale Municipal Code.



Regulate select single-event noises and periodically monitor the effectiveness of the regulations.





A P P E N D I C E S

City of Sunnyvale 2010 NOISE CONDITIONS

Noise Exposure - 50' from
Edge of Road/Railroad

- 75-79 Ldn
- 70-74 Ldn
- 65-69 Ldn
- 60-64 Ldn



0 2000 4000 6000 Feet

City of Sunnyvale
Department of Community Development
February 20, 1997

City of Sunnyvale
Noise Sub-Element



MOFFETT FIELD COMPREHENSIVE USE PLAN ENVIRONMENTAL ASSESSMENT

FIGURE 16

Mitigated Year 2010 Forecast Noise Exposure Conditions (CNEL)

LEGEND

- Major IFR/VFR Flight Tracks
- CNEL Noise Contours (65-75 dB)
- - - CNEL Noise Contour (60 dB)

Source: P & D Aviation

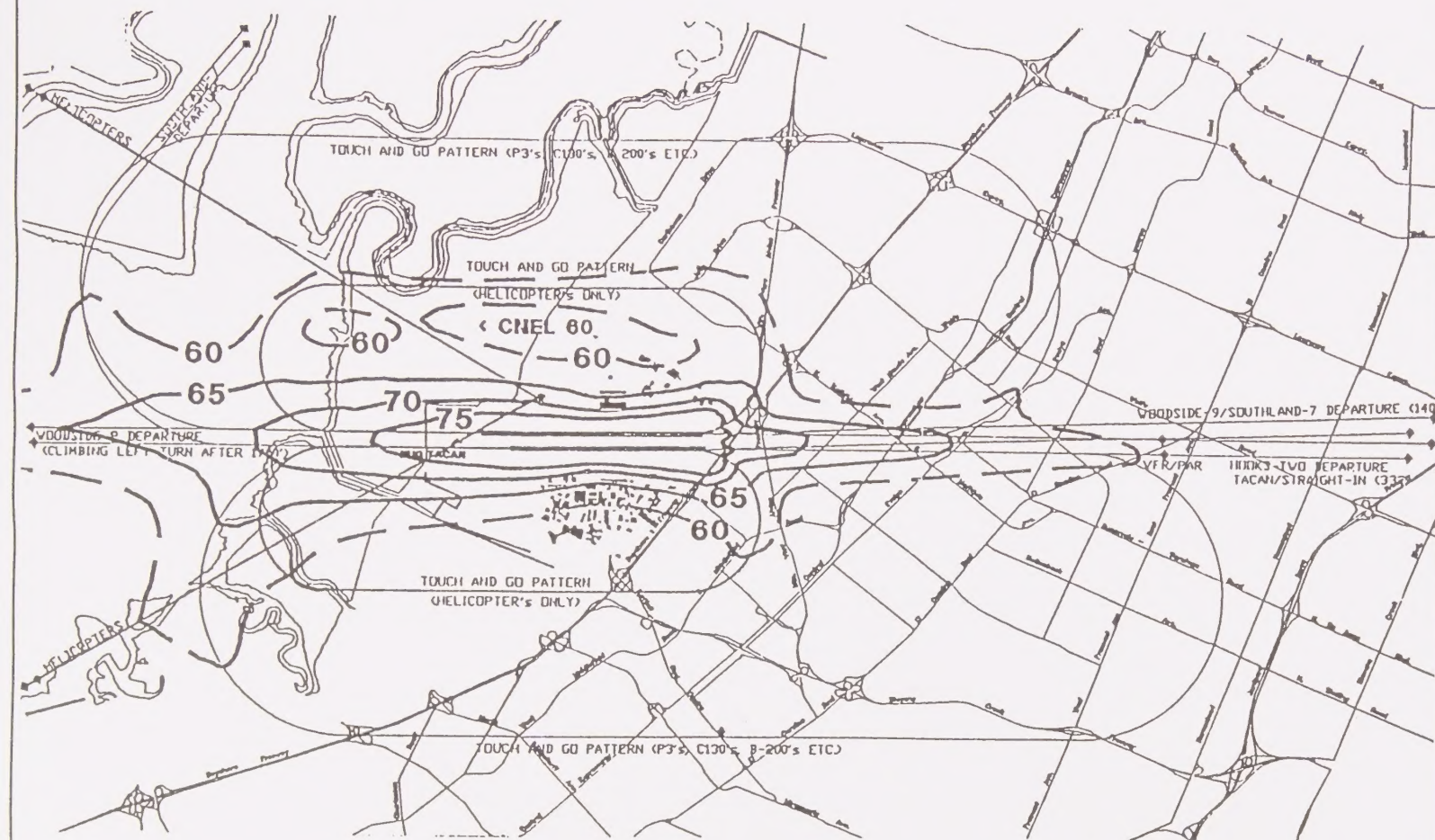


SCALE IN FEET
0 1000 2000 3000 4000

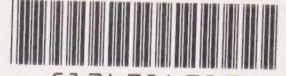
NASA

City of Sunnyvale
Noise Sub-Element

Appendix B



U.C. BERKELEY LIBRARIES



C124914917



Department of Community Development
456 West Olive Avenue
P.O. Box 3707
Sunnyvale, CA 94088-3707
(408) 730-7444